

ABSTRACT OF THE DISCLOSURE

5 **METHOD AND SYSTEM FOR COMPUTING**
DIGITAL CERTIFICATE TRUST PATHS USING TRANSITIVE CLOSURES

10 A method, system, apparatus, and computer program
product are presented for managing digital certificates.
When entities need to engage in a secure transaction or
open a secure communication link, they may exchange
digital certificates in order to provide a public key or
reference information to a public key for the opposing
15 entity, thereby requiring validation of a received
certificate. Rather than construct a trust path for each
validation event, hierarchical certifications and
peer-to-peer cross-certifications among a set of
certificate authorities are represented by a set of trust
20 relations, and trust path information is generated using
a transitive closure computation and an "all pairs
shortest paths" computation over the set of trust
relations and then incrementally updated as the set of
trust relations changes. Computations related to trust
25 paths can be delegated to a central agent in a trust web.